

TOMTOM ENABLES AUTONOMOUS DRIVING



OVERVIEW

Autonomous driving is the most disruptive change in the automotive industry since the invention of the car. Autonomous driving will completely transform not only the way we commute but will boost safety, comfort and efficiency of vehicles to a level beyond imagination.

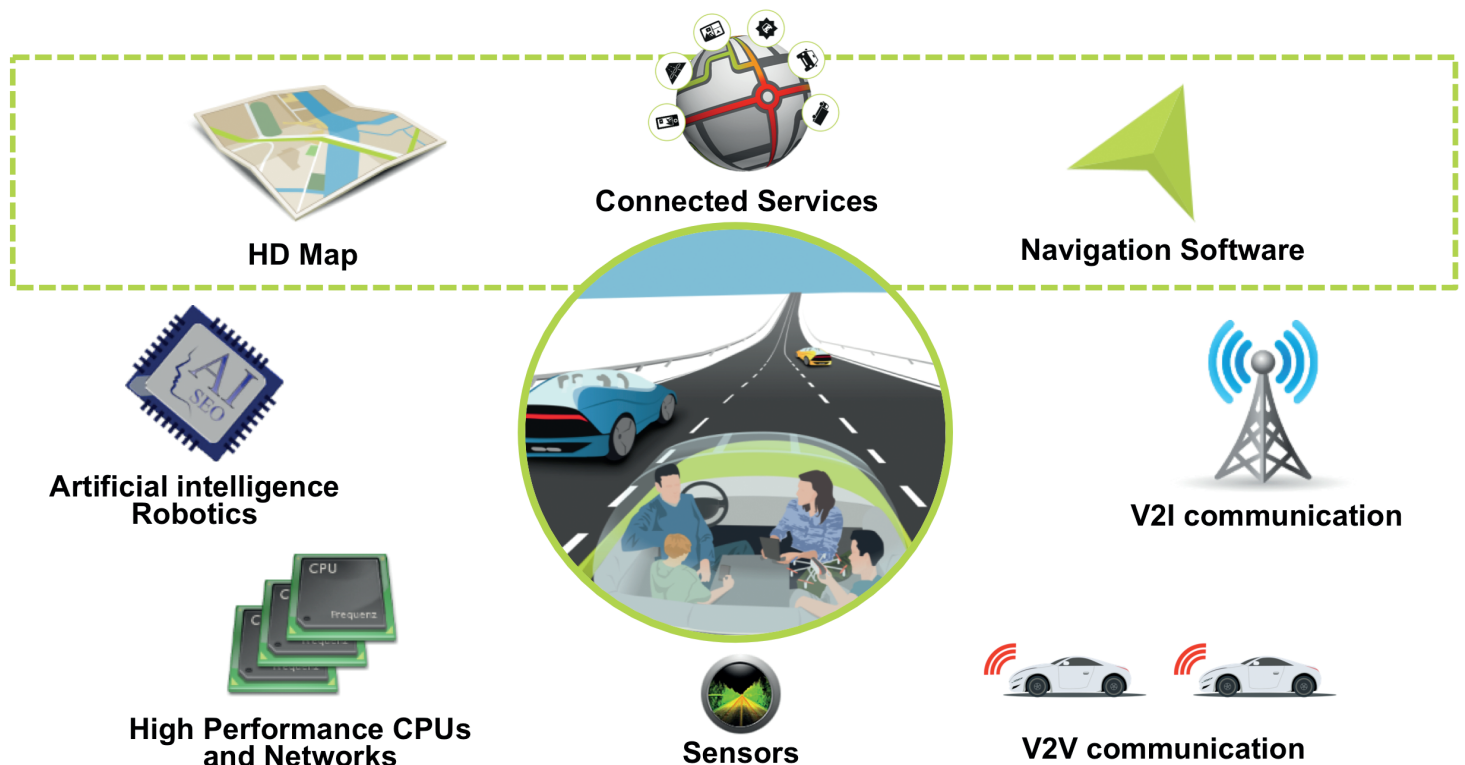
As OEMs engage in autonomous driving pilots, TomTom provides autonomous driving solutions, including highly detailed and accurate lane level map and positioning content that complements other in-car systems. TomTom's HD Map augments and extends the range of in-car sensors in automated driving modes.

Along with autonomous driving content, TomTom is first in the market with real-time maps and services, allowing end-users to know quickly when road attributes or conditions have changed. Our unique transactional mapmaking engine reduces the lead time for changes in the road network to be updated to users' maps within days. Combined with Sensor Derived Observations (change detection from in-vehicle ADAS hardware, such as cameras, radar, etc.) and TomTom live content, TomTom autonomous driving map content provides the most robust content for autonomous driving applications. By leveraging its big data experience and infrastructure, TomTom expands its product reach exponentially in the autonomous driving evolution.

THE BUILDING BLOCKS OF AUTONOMOUS DRIVING

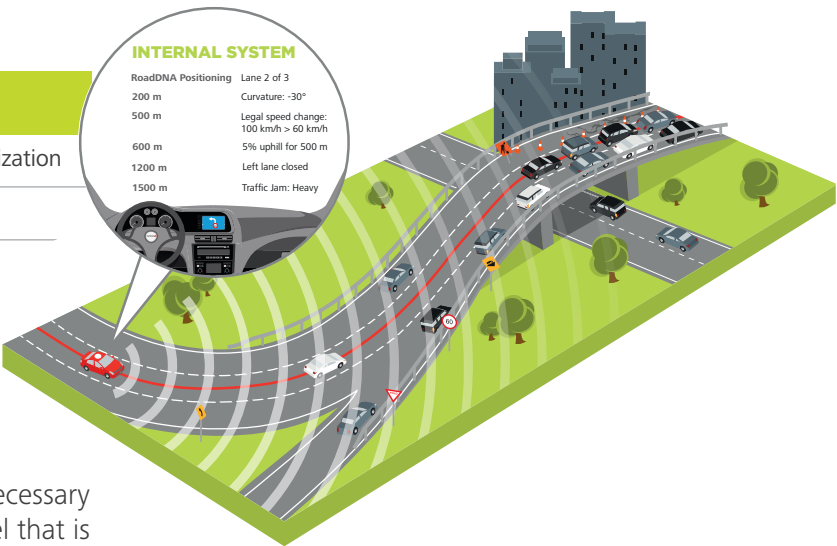
Many high tech components need to work together to achieve autonomous driving success. TomTom's more than 25 years of mapmaking expertise, combined with experience working with deep neural networks and machine learning enables the

creation of award winning, world class products. TomTom offers critical elements such as an HD Map for localization, connected services for road conditions and obstacles and navigation software for advanced road planning.



HIGHLY PRECISE AUTONOMOUS DRIVING MAP CONTENT

ATTRIBUTES	END USER BENEFITS
Lane dividers	Highly precise vehicle localization
Lane center lines	Small data footprint
RoadDNA	Robust feedback
Road edge dividers	



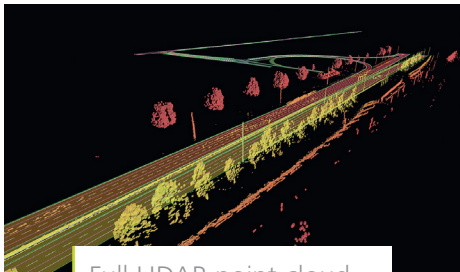
HD MAP

TomTom takes all the important roadway attributes necessary for vehicle positioning and control and creates a model that is both highly efficient and consumable for in-vehicle functions. The content that TomTom provides helps enable OEMs to accurately determine the current and upcoming precise location of the vehicle.

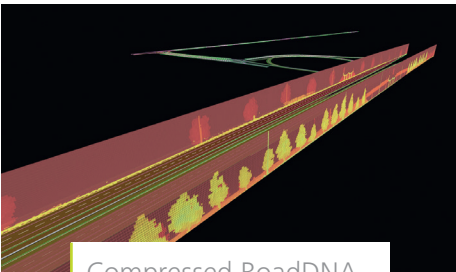
ROADDNA

TomTom has pioneered a novel concept for vehicle localization, RoadDNA. This TomTom innovation allows for precise lateral and longitudinal positioning in a storage and processing friendly format while still using the power of a detailed LIDAR point

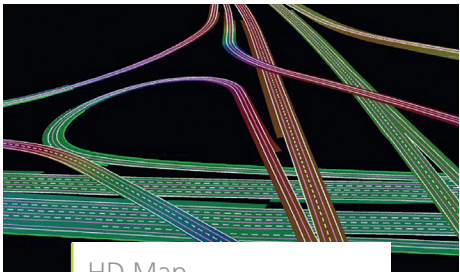
cloud data. This is accomplished by being feature agnostic with the roadway data. This patented solution assists with providing necessary content and libraries to work with in-vehicle hardware to efficiently determine a vehicles position.



Full LIDAR point cloud




Compressed RoadDNA



HD Map


CONNECTED SERVICES

TomTom’s connected services enable an improved driving experience. Detailed weather and traffic services ensure cars can see beyond their sensors with the most updated information:



TRAFFIC

Jam ahead warnings
Jam lifetime
Lane level Traffic



WEATHER

Severe weather warnings
Precipitation feeds
Road slipperiness
Speed adaptation mode